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54 Package for mixing and dispensing.

57 A package for two co-reactive components which must be contained isolated from one another and mixed together a limited time before use comprises first and second containers each containing one of the components and at least one of the containers containing a propellant, the containers being releasably connected by a guide sleeve to permit relative movement of the containers towards one another and open reciprocable interconnecting valve means on the containers to permit mixing of the components.

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## PACKAGE FOR MIXING AND DISPENSING

This invention relates to the packaging of two co-reactive components which must be contained isolated from one another and remain mixed together a limited time before use and particularly to a package for the mixing and pressurised dispensing of co-reactive components.

It has been proposed in GB 1 125 528 to pack a hair dye comprising an oxidative dyestuff and an oxidising agent in two separate containers each having a valve. The oxidising agent is contained in a first container together with a propellant and the dyestuff in a second container. The containers are placed in valve-to-valve position and the valves opened so that the oxidising agent is transferred to the second container by the propellant together with a quantity of propellant. The containers are separated and after shaking to mix the contents the mixture can be dispensed from the second container under pressure from propellant by manual operation of the valve. As proposed in GB 1 125 528 each of the containers are standard aerosol containers with conventional valves having hollow stems which are joined together for mixing by a connecting piece. It is therefore necessary for the user to connect together the two containers with the connecting piece prior to use.

Apart from the inconvenience of this procedure there is the risk of the connecting piece being lost or used to connect together an incorrect pair of containers and the risk of leakage because of difficulty in correctly aligning the containers with one another.

According to the present invention there is provided a package comprising two containers each containing a co-reactive component at least one of the containers containing a propellant, a guide sleeve releasably connecting the containers to one another with a reciprocable interconnectable valve means on each container adapted to interconnect and provide a passageway therethrough from one container to the other the guide sleeve permitting movement of the containers with respect to one another whereby the valve on both of the containers can be opened and closed.

There is thus provided a single package which can be conveniently stored by the user until required. Shortly before use the containers are moved towards one another under the restraint of the guide sleeve to allow the components to mix together in one of the containers. The guide sleeve minimises accidental leakage of one or both components when the containers are brought together to mix the components. The containers can then be

separated and, if necessary after shaking to mix, the mixture can be discharged by manual operation of the interconnectable valve of the container containing the mixture.

Alternatively the container containing the mixture of components can be provided with a second discharge valve for the release of the mixture. This discharge valve can be at the end of the container opposite the interconnectable valve.

Preferably there is provided removable stop means preventing inadvertent movement of the containers towards one another leading to premature opening of the interconnectable valves and mixing of the components.

The guide sleeve can be attached to one of the containers and the other container can be slidable within the guide sleeve. Alternatively an alignment sleeve can be attached to the other container, the alignment sleeve providing a surface which cooperates with the guide sleeve to assist in maintaining the containers in alignment when the containers are moved towards one another.

The valves can comprise a male valve on one container and a female valve on the other container interconnectable by engagement in the direction of movement of the containers permitted by the guide sleeve, each valve being resiliently biased to the closed position, the guide sleeve guiding the movement of the containers towards and away from one another in the common direction of operation of the valves.

The package can include an operating button adapted to be fitted to the valve of the container containing the mixture of components to facilitate manual operation of the valve and application of the mixture to the desired location.

The invention will now be more particularly described with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a perspective elevation of a package according to the invention;

Figure 2 is a cross sectional elevation of the package of Figure 1;

Figure 3 is a view similar to Figure 2 with the containers interconnected;

Figure 4 is an elevation of an alternative embodiment showing the guide sleeve in cross-section; and

Figure 5 is an elevation similar to Figure 4 showing a further alternative embodiment.

As shown in Figure 1 the package 1 comprises two cylindrical containers 2 and 3 which can be standard aerosol type cans. The containers are releasably connected together by a guide sleeve 4 secured to the upper container 2 and slidable over

the lower container 3. The guide sleeve can be of plastics material and as shown in Figure 2 be provided with annular ribs 5 and 6 to snappingly engage with the top of the container 2. The lower container 3 is provided as shown in Figure 2 with an alignment sleeve 7 which can also be snappingly secured to the top of container 3 by annular ribs 8 and 9. The outside surface 10 of the alignment sleeve substantially corresponds to that of the container body 3. At the lower end of the alignment sleeve is a releasable stop means 11 which extends below the bottom edge 12 of the guide sleeve and prevents inadvertent movement of the containers towards one another. The stop means 11 can be removed by gripping the tab 13 and tearing the stop means from the alignment sleeve.

The upper container 2 is provided with a male valve having a stem 14 and the lower container 3 has a female valve with an opening 15 adapted to receive the stem 13. Both valves are resiliently biased to the closed position and as shown in Figures 1 and 2 the valves on both containers are closed.

In the embodiment shown the component in eg. the upper container would be contained together with a propellant. The component in the other, ie lower container would be contained without any propellant or with a propellant at lower pressure than that of the upper container. The presence of a propellant in both containers has the advantage that both containers can be readily subjected to a pressure test by the hot water bath technique and the risk of leakage from the containers in use can therefore be minimised.

In use the user removes the removable stop means 11 by tearing it from the alignment sleeve and then presses the two containers together, ie by applying pressure to the top of the package. Having removed the stop means 11 the guide sleeve 4 is free to slide downwardly over the alignment sleeve 7 and the lower container 3 so that the applied pressure brings the valve stem 14 into the female valve and opens both the male and female valve as shown in Figure 3 to provide a passageway between the two containers. After waiting for an appropriate interval of time for the components in the upper container to pass through the two valves into the lower container the containers are moved apart and separated from one another by sliding the upper container together with the guide sleeve 4 away from the lower container. An operating button (not shown) of any convenient form can then be fitted to the valve on the lower container and manually operated to dispense the mixture under pressure from the propellant.

There is thus provided a simple and convenient package which is easy for the user to operate shortly before use. An operating button can be removably attached to the package if required or alternatively the valve means can be arranged such that it can be manually operable without the use of such a button. The package is tamperproof and prevents inadvertent premixing of components or errors by the user in mixing or trying to mix together the contents of containers containing incorrect components.

Referring now to Figure 4 there is shown an alternative embodiment comprising an upper container 16 and a lower container 17. A guide sleeve 18 snappingly engaged with the top of the lower container is a sliding fit over an alignment sleeve 19 similarly snappingly engaged with the bottom of the upper container. Stop means formed by tear-off strip 20 on the guide sleeve prevents the containers moving closer together than the position shown in Figure 4 prior to removal of the tear-off strip.

The lower container is provided as before with a valve 21 at the upper end. Not shown in Figure 4 is a reciprocable valve in the lower end of the upper container which is interconnectable with the valve 21 of the lower container. As shown in Figure 4 the valve 21 is a male valve so the valve in the bottom of container 16 is a female valve.

At the upper end of the container is provided a discharge valve 22 which can be provided with any form of operating button most suited to the nature and use of product to be dispensed.

Both the containers are initially charged with one of the components which are co-reactive. At least the lower container 17 is also charged with a propellant. In use the user removes the tear strip 20 and applies pressure to bring the two interconnectable valves together, opening them and allowing the component in the lower container 17 to be urged by excess pressure into container 16. Container 16 can then be removed from the guide sleeve 18 and after any necessary mixing by shaking, the mixture of the reaction components can be discharged via the discharge valve 22.

Thus in this embodiment any appropriate operating button can be applied by the manufacturer to the valve 22 before the package reaches the user. The package can therefore be supplied to the user in a single unit for use and any necessity for the user to fit an operating button is avoided.

In both the embodiments it can be advantageous to provide some form of positive engagement between the guide sleeve and the alignment sleeve before use so that the two containers remain as a unit. For example an annular bead on the guide sleeve can engage in annular groove on

the alignment sleeve, the engagement being sufficient to maintain the containers together but readily disengageable by the hand pressure necessary to effect mixing of the components.

Referring now to the embodiment of Figure 5 a first container 23 is contained within a holder 24 having a base 25. The holder 24 extends above the container 23 to form a guide sleeve portion 26 having an inner diameter 27 which is a sliding fit around the outside of upper container 28 shown above the holder for clarity. The outer diameter of the guide sleeve portion is reduced at 29 and provided with a plurality of apertures 30. A removable stop means is provided in the form of an annular sleeve 31 extending around the reduced portion 29 having internally extending projections 32 extending through the apertures 30. A line of weakness 33 in the sleeve 31 enables the user to grip a tab (not shown) and tear part 34 of the annular sleeve away to remove the stops formed by the projections 32.

In this embodiment the lower container 23 would conveniently contain one of the co-reactive components together with a propellant. The upper container 28 would contain the other co-reactive component either without propellant or with propellant at a lower pressure than in the container 23. The containers are provided with interconnectable valves, the lower container 23 being shown in Figure 5 with a male valve 35 and the upper container 28 having a female valve (not visible). The package can conveniently be provided to the user with the upper container 28 slidably inserted into the upper end of the guide sleeve 26. The projections 32 engage the shoulder 35 of the upper container to prevent premature operation of the interconnectable valves.

In use the user removes the part 34 of the stop means and pushes the upper container downwardly to open both interconnectable valves and allow mixing of the components. The upper container 28 is then removed and fitted with an appropriate button to allow the user to apply the mixture of components as required under pressure from the propellant.

Whilst the package of the present invention is particularly useful for containing oxidative hair dyes it is equally suitable for other products in which the components must be stored separately and mixed together shortly before use such as various types of paint, foamants, adhesives and the like.

## Claims

1. A package comprising two containers - (2,4,16,17,23,28) each containing a co-reactive component at least one of the containers containing a propellant and having a reciprocable valve means (14,15,21,35) characterised in that there is provided a guide sleeve (4,18,26) releasably connecting the containers one to another and permitting movement of the containers with respect to one another whereby the valve (14,15,21,35) on both of the containers can be opened, the reciprocable valve means (14,15,21,35) being adapted to interconnect and provide a passageway therethrough from one container to the other.

2. A package according to Claim 1 characterised in that one of the containers (16) is provided with a second valve (22) for discharging the mixture of components.

3. A package according to Claim 2 characterised in that the second valve (22) is at the end of the container (16) opposite the interconnectable valve.

4. A package according to any one of the preceding claims characterised in that there is provided removable stop means (11,20,31) preventing inadvertent movement of the containers towards one another to effect opening of the interconnectable valves.

5. A package according to any one of the preceding claims characterised in that the guide sleeve (4,18,26) is attached to one of the containers (2,17,28) and the other container (3,16,23) is slidable within the guide sleeve.

6. A package according to Claim 5 characterised in that an alignment sleeve (7,19) is secured to said other container (3,16) to provide a surface (10) which cooperates with the guide sleeve (4,18) to assist in maintaining the containers (2,3,16,17) in alignment when the containers are moved together.

7. A package according to any one of the preceding claims characterised in that the interconnectable valves (14,15,21,35) are provided by a male valve on one container and a female valve on the other container interconnectable by engagement in the direction of movement of the containers permitted by the guide sleeve, each valve being resiliently biased to the closed position.

Fig.1.

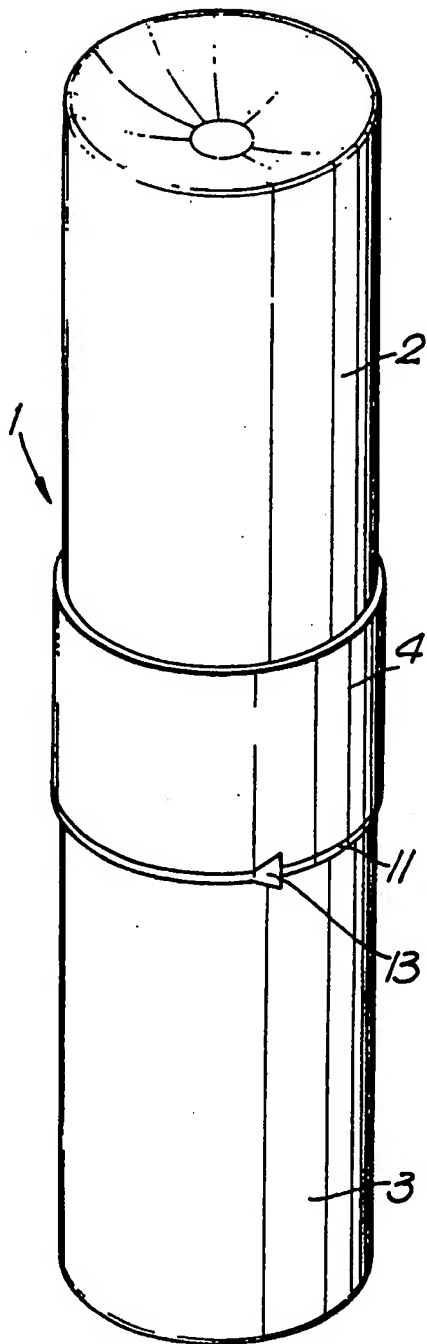


Fig.4.

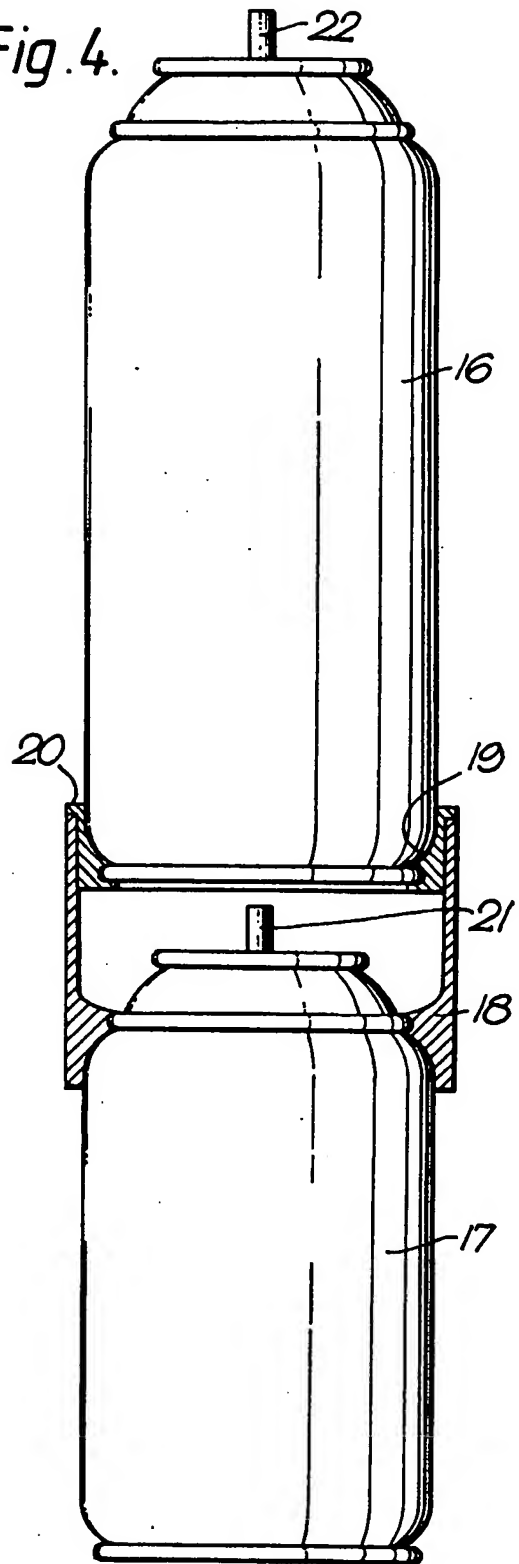


Fig.2.

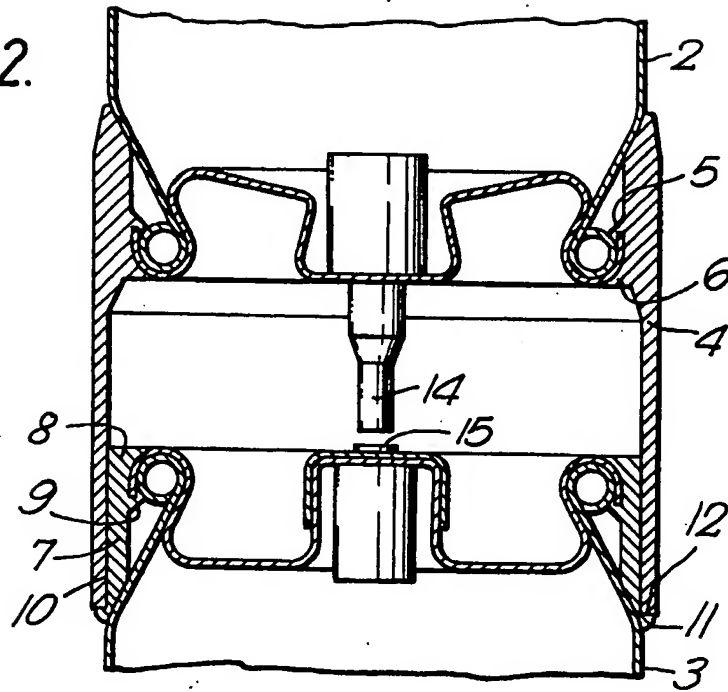


Fig.3.

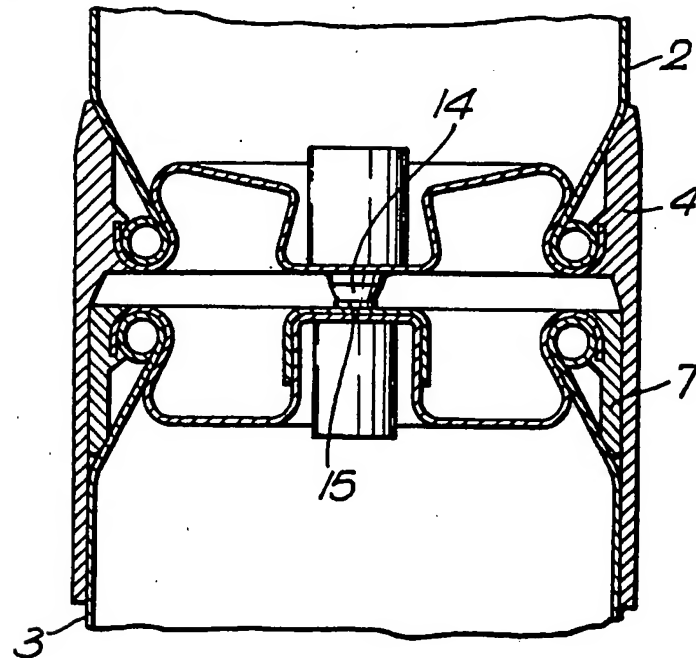


Fig. 5.

